MASTERY OF BASIC MATHEMATICS FOR HIGH SCHOOL STUDENTS IN SOLVING MATHEMATICS PROBLEMS

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ABSTRACT

This study aims to determine the extent to which high school students can master basic mathematics, especially fractions. This research was conducted at the Stabat Preparatory High School with a total of 40 students. This research was conducted using two methods, namely quantitative and qualitative methods. The quantitative method serves to measure the level of mastery of students' basic mathematical abilities in solving problems and the qualitative method aims to describe students' basic mathematical abilities and see how far students master basic mathematics in solving problems. Problems on fractional material given in essay form. Based on the answers of the students, the following proportions were obtained: the level category 1. The ability of students in the high category was 10%, namely 4 students, level 2. Level 2. The ability of students in the medium category was 25%, namely 10 students, and Level 3. The ability of students in the low category by 65% or 26 students. So it can be concluded that there are still many students' abilities that have not mastered the basics of mathematics.

Keywords: Basic Mathematics Ability, Fractions, Basic Mathematics Ability Category

INTRODUCTION

Mathematics is a science that studies the relationship of a pattern, shape and structure. The reason why mathematics is difficult to learn is the characteristic of mathematics, whose object of discussion is abstract, uses symbols, and relies on reason, and is only seen as an existing product. Whereas in reality, understanding the concept is a very important thing in solving math problems, and being able to apply it in the real world.

Mastery of the basics of mathematics is an important capital to be able to master broader and deeper mathematical concepts. The incompleteness of students' basic mathematical abilities can be the reason for students' mathematics learning achievement to be low. Anwar, Maonde, & La Masi's (2018) research on the basic mathematical knowledge of junior high school students confirms this. The low mathematics ability of junior high school students is caused by students who do not master basic mathematics materials that should have been completed at the previous level.

Basic mastery of mathematics is also important in mastering other sciences. The results of the research by Mardiyatmi & Abdullah (2018) and Chusni (2017) show that basic math skills have a significant effect on science learning competencies, especially Physics. Albaladejo et al. (2018) and Villanueva-Cantillo, Orozco-Guzmán, Acuña, Castro, & Malo (2020) also found that mastery of the basics of mathematics is a factor in student success in their first year of study. Therefore, the basics of mathematics need to be taught to students appropriately and comprehensively so that they are able to master the next level of concepts.

One of the issues in learning mathematics in senior high schools is the inadequate ability of students' basic mathematics, especially in numbers and algebra. Even though they have completed mathematics lessons in elementary and junior high schools and received number and algebra material repeatedly (spirals), there are still many students who are weak in this material. As a result, there are still many students who have difficulty solving advanced

math problems when they are in high school. The researcher found the fact that when students were given math questions at the high school level, they actually understood the direction of solving the problem. However, they are constrained in understanding basic concepts such as integer operations, fractions and algebra as a solution process. The low basic mathematical ability of high school students was also found by Zaina & Johar (2019) on arithmetic operations and Oktapiyanti & Amelia (2020) on mathematical representations. In addition, each student has a different level and realm of mastery of basic mathematics. Therefore, efforts are needed to improve the basic mathematical abilities of high school students who are able to accommodate the diversity of levels and domains of mastery.

Based on teaching experience in SMA Persiapan Stabat, researchers still find many students in class who are still unable to solve multiplication problems to basic fractions. For example, in derived material, students are unable to answer the question due to a lack of mastery of basic mathematics. The habit of only memorizing formulas results in students forgetting and not being able to master the basic material which is a requirement for learning the next material. Students who do not understand the process of formula formation, and do not read books related to learning will experience difficulties in developing basic mastery of learning. Furthermore, it will also affect in improving the ability to understand the concept of learning.

LITERATURE REVIEW

According to the Big Indonesian Dictionary, ability comes from the word "able" which means being able to do something. Then it can be interpreted as ability, namely ability/strength/skill in doing something. Each student has different abilities in responding to questions or problems ranging from basic knowledge to higher and broader knowledge. Likewise on the ability of students in mathematics. high and low students' ability is measured from the learning outcomes of students. In addition, it can be seen from the students' basic mastery of mathematics. Students who can solve math problems at a higher level are generally not only due to perseverance in learning, but also can be seen from the ability of these students to master the basics of mathematics. According to Slameto (2010) the basic abilities possessed by students before starting a new lesson, have an influence on students' ability to understand the subject matter they will face. This happens if there is relevance between basic abilities and new subject matter, especially if the initial knowledge is knowledge of the requirements of the next lesson. This relevance appears in monitoring student learning outcomes in a certain period of time. This is because in general student learning outcomes listed as quarterly or semester report card scores in a particular field of study show developments in learning outcomes in the next one, two or three years.

Thus, the basic ability behavior has two characteristics, namely: (1) as a prerequisite for learning to face the next lesson, and (2) has a relationship with learning outcomes in the material and subsequent learning tasks. From his statement it is clear that students have basic abilities that can be influenced by two factors, namely internal factors (heredity) and external factors (educational environment). This is related to the basic abilities of students, that is, if students have good basic abilities, further development will lead to success. If this is analogous to the teaching and learning process, then with good basic skills in Mathematics, good results will also be obtained. To get good learning achievement in Mathematics, students' basic Mathematics skills must also be good. The basic abilities possessed by students can be said to be good if an evaluation (assessment) has been carried out.

METHODS

In this study using two methods, namely by using quantitative and qualitative methods. The

quantitative method aims to measure the level of mastery of students' basic mathematical abilities in solving problems and the qualitative method aims to describe students' basic mathematical abilities and see how far students master basic mathematics in solving problems so that the teacher can group students based on mastery of students' abilities so that in the future students experience difficulties and confused in solving questions with a higher level of material so that students can solve math problems properly and correctly in the future.

The description and monitoring of the ability to master basic mathematics is carried out by direct observation when students solve the problems given. The questions are given in essay form as many as 5 questions with levels from easy to difficult. Then the results of the students' answers will be analyzed and the level of understanding of the students will be measured based on the indicators in table 1 so that it can be seen to what extent students can master basic mathematics. This research will be carried out at the Stabat Preparatory High School in grade 12 high school consisting of 40 students.

Table 1. Criteria for Grouping Mathematical Basic Ability (KAM)

KAM Value	Mathematics Basic Ability Category
$KAM \geq \bar{x} + SB$	High
$\bar{x} - SB \leq KAM \leq \bar{x} + SB$	Medium
$KAM < \bar{x} - SB$	Low

RESULTS AND DISCUSSION

Result

The results of observing students' basic mathematical mastery abilities and measuring students' abilities based on indicators in Table 1. Where the basic mathematics mastery abilities of high school students in answering fraction questions obtained the proportion of students' abilities based on levels.

Table 2. Levels of Basic Mathematics Mastery of High School Students

Level	Total Students	Proportion
1 (High Category)	4	10%
2 (Medium Category)	10	25%
3 (Low Category)	26	65%

From the data above, 65% of students are in the low category, 25% in the medium category and 10% in the high category. This shows that students still need special attention in understanding the basics of mathematics lessons, especially basic calculations such as calculating fractions so that in the future students are able to master advanced and advanced mathematics material. its application in various fields. From these data we can also see the low ability of students in completing basic calculations, especially fraction calculations where the material has actually been obtained since elementary school (SD) so that it can be seen that this certainly has a big influence on students' abilities in completing calculations in high school (SMA) advanced level material. As a result, the basic calculation skills that have not been fully mastered will of course have a direct effect on students' math scores in the class and it is also necessary to pay attention to this, there is a fear of causing giving students self-confidence in learning high school (SMA) advanced level material

Achievement of ability to master the basics of mathematics in high school students. The following is the result of student work for each level. **Level 1. The ability of students in the high category.** Students can solve complex problems, namely from simple fraction problems to story problems, where students observe the problem so that they can understand the problems in the problem and can then formulate it in mathematical form so

that they can solve the problem properly and correctly at a high level. In the observations made, there were 4 students who were able to solve questions up to story questions, 3 students of whom did not have an analysis of the mathematical formula given and the answers given were also not correct. A student gives a determining analysis of the problem then writes it in the form of a mathematical formula and the student answers the question correctly.

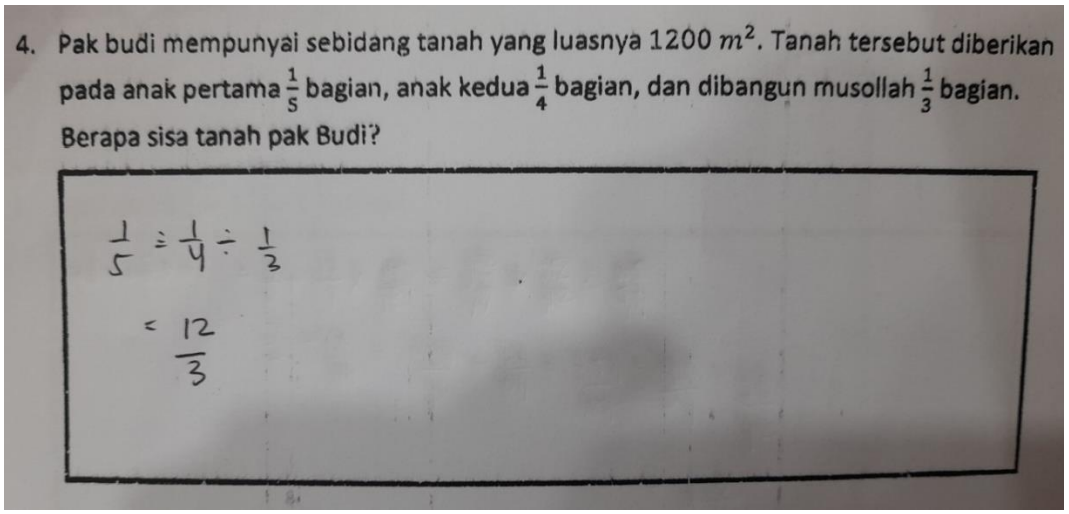

Figure 1. Student Answers to Question No.4

In Figure 1. It can be seen that students have not been able to understand the problem properly. Based on the results of interviews with students, they answered that students had not mastered the meaning of the questions given, so they could not determine the mathematical formula and answer correctly.

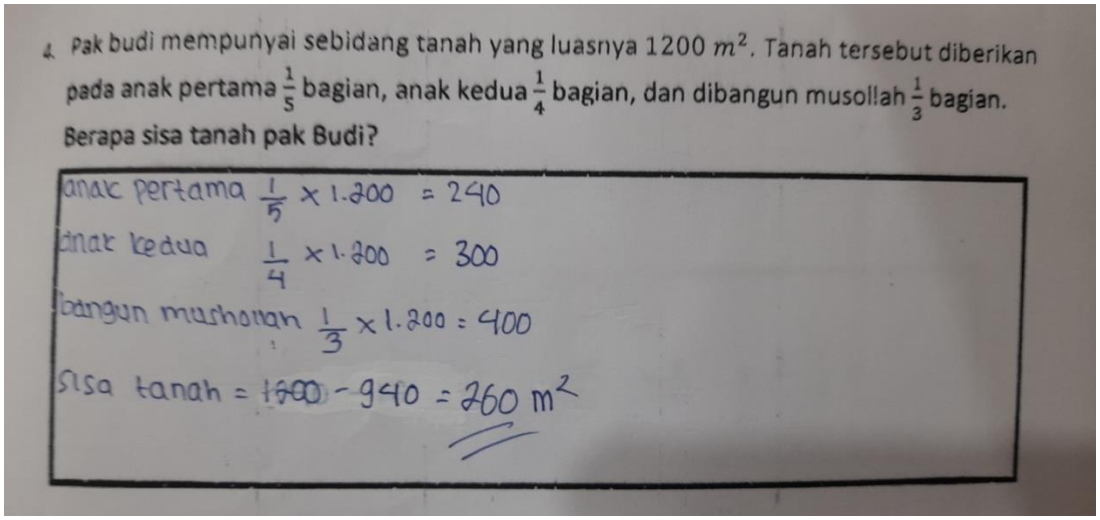

Figure 2. Correct Student Answers at No.4

In Figure 2 students are able to analyze the questions well so that they can determine and formulate mathematical formulas in solving the problems given. Students are also able to sort answers in a systematic and structured manner so that the results of the answers that are done are correct.

Level 2. The ability of students in the medium category. Students can solve simple problems in the form of mixed fraction problems and problems with more than one mathematical operation. In simple questions such as in question no 1 as many as 10

students could not answer correctly. In the sense that students cannot determine which mathematical operations must be completed first. In addition, students still experience difficulties in solving division problems as shown in Figure 3. However, students try to answer the questions well in displaying the process of solving the problems.

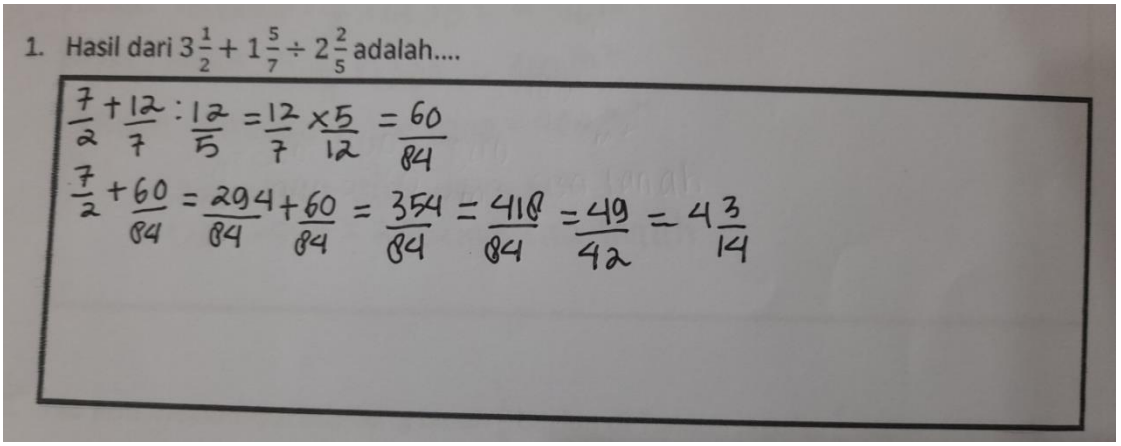

Figure 3. Student Answers No.1

Level 3. The ability of students in the low category. Students are unable to provide answers to the questions given in Figure 4. Students in this category are students who do not know basic multiplication yet, so when given questions at a higher level such as fractions, they are unable to solve them. In the observations made, the category of students with low abilities as many as 26 students did not complete 5 questions, 10 of them only answered 3 questions.

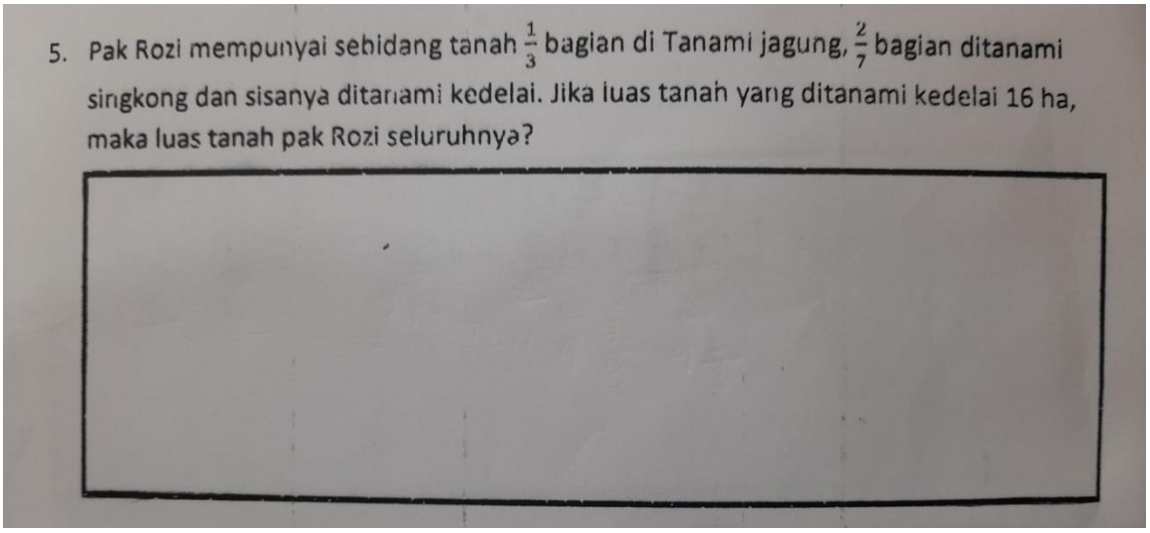

Figure 4. Student Answers to Question No.5

Discussion

The results of the study found that many high school students' numeracy skills were still low. This should be a concern for teachers in the future so that they can improve learning outcomes in other materials. Basically, high school students must have the ability to count fractions, considering that this material has already been obtained in elementary school. . As many as 65% of students are in the low category, 25% are in the medium category and only 10% are in the high category, this shows that students still need more attention in understanding the basics of mathematics lessons so that in the future.

Apart from having an impact on students' abilities to work on other high school material, of course it will also have an impact on other computational lessons such as physics or chemistry which include various calculations, in line with research conducted by Ander, Karuru, P., Bergita, Saka (2022) who examined the effect of basic numeracy skills on the physics learning outcomes of class X students at SMA Negeri 5 Tana Toraja. In this study it was found that if the basic ability of mathematical calculations increases, it will have an influence on physics learning outcomes.

CONCLUSION

From the explanation of the results of the research above, it can be concluded that the ability of students to work on fractional problems is still in the low category. Of course, this has a direct influence on students' ability to work on other materials such as differentials or other materials. This must receive special attention from the teacher. so that in the future students will have better basic arithmetic skills in order to support understanding of material at an advanced level.

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